

Uncovering and Overcoming Ambivalence: The Role of Chronic and Contextually Activated Attachment in Two-Person Social Dilemmas

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Abstract

Objective: Humans face an enduring conflict between desires to affiliate with others but to protect the self; effective social functioning often requires reconciling the resulting ambivalence between these motives. Attachment anxiety is characterized by chronically heightened concerns about affiliation and self-protection; we investigated how anxious individuals' chronic relational ambivalence affects interpersonal behavior.

Method: We used the Prisoner's Dilemma and the Assurance Game to examine how the ambivalence associated with attachment anxiety affects pro-social behavior, comparing chronic attachment anxiety with both chronic (Study 1; $N=94$) and contextually activated (Study 2; $N=56$) security.

Results: Chronic attachment anxiety was associated with ambivalent behavior in the social dilemma games. Specifically, the chronically anxious were mistrustfully inconsistent in their strategic choices and took more time to make these choices. However, priming the chronically anxious with attachment security decreased ambivalence by promoting more fluent cooperative behavior.

Conclusions: To our knowledge, these are the first studies to examine the effect of the anxiously attached's chronic relational ambivalence on pro-social behavior. These findings illustrate that the simultaneous activation of affiliation and self-protection can have interpersonal consequences, increasing mistrust and hesitance. Importantly, however, we were able to attenuate these effects by priming felt security.

Keywords: adult attachment, anxious-ambivalence, priming, prosocial behaviour, social dilemmas

Humans are social animals, fundamentally motivated to establish meaningful interpersonal connections (Baumeister & Leary, 1995). However, our survival instinct drives us to protect the self from harm. To effectively navigate our social world, we need to reconcile this motivational ambivalence (i.e., to affiliate but protect the self) by choosing to approach as appropriate, or risk isolation (Murray, Derrick, Leder, & Holmes, 2008; Murray, Holmes, & Collins, 2006). Certain contexts can make navigating this interdependence dilemma difficult for anyone, but for some—like those who are high in attachment anxiety—it is particularly difficult because ambivalence between affiliation and self-protection is chronically activated (Bartz & Lydon, 2006; Bowlby, 1973; Mikulincer & Shaver, 2007a). We call the conflict between these two motives *relational ambivalence* (see also Mikulincer, Shaver, Bar-On, & Ein-Dor, 2010). Although this ambivalence is a fundamental characteristic of attachment anxiety, it has been relatively understudied in comparison to the wealth of research on affiliation and self-protection motives studied in isolation; nonetheless, we believe this ambivalence can have profound

interpersonal implications. In the following studies, we investigated the behavioral consequences of chronic relational ambivalence for the anxiously attached, specifically whether their ambivalence undermines pro-social behavior. We then asked whether contextually activating felt security would attenuate ambivalence by promoting more pro-social responding.

Attachment Anxiety and Ambivalence

Bowlby (1969/1982, 1973) proposed that humans have an innate behavioural system designed to foster social connectedness; this attachment system develops in infancy and operates

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throughout adulthood (Ainsworth, Blehar, Waters, & Wall, 1978; Hazan & Shaver, 1987; Mikulincer & Shaver, 2003, 2007a). Optimal functioning occurs when people feel accepted and supported by the important individuals in their lives, resulting in the experience of felt security. If people do not feel accepted and supported, however, they become insecure, distressed, and, accordingly, self-interested (Mikulincer & Shaver, 2007b).

For some, this insecurity is chronic, resulting in the adoption of suboptimal but partly functional compensatory strategies. Specifically, if others have been consistently unavailable, coping mechanisms include deactivating the attachment system and avoiding dependence. These avoidantly attached individuals tend to be excessively self-reliant and have generally negative views of close others. By comparison, if others have been inconsistent sources of support, anxiety about abandonment increases, the attachment system is hyperactivated in an effort to attain felt security, and hypervigilance is maintained to detect signs of threat (Mikulincer & Shaver, 2003). Attachment anxiety is thus associated with an unresolved state in which the motives to affiliate but to also protect the self are chronically activated, resulting in persistently heightened relational ambivalence. Ironically, this ambivalence may undermine the social connection anxious individuals crave.

The negative consequences of anxious individuals' hyperactivated affiliation motive and of their hypervigilance for rejection have been well documented (Mikulincer & Shaver, 2007a). However, far fewer studies have investigated the costs of their simultaneous activation (i.e., of relational ambivalence). There is, however, some initial evidence linking attachment anxiety to ambivalent reactions. Bartz and Lydon (2006, 2008) found that anxiously attached individuals react to affiliative overtures by potential close others not with relief but, ironically, with heightened anxiety and rumination. Similarly, Mikulincer et al. (2010) found that anxiously attached individuals have ambivalent attitudes toward and motivations about closeness and close relationship partners at explicit and implicit levels. Notwithstanding these studies, little is known about how anxiously attached individuals' relational ambivalence affects overt social behavior.

Challenges in Studying Relational Ambivalence as Manifested in Behavior

One challenge in studying the behavioral effects of a motive conflict like relational ambivalence is that a given instance of behavior could result from several different patterns of underlying motives. For example, if two conflicting motives are reconciled through compromise, then the manifested behavior would approach the norm or midpoint of the relevant, available behavioral set. However, such moderate behavior could also result from a unidirectional but weak motive. Alternatively, if conflicting motives are manifested in behavior as a result of zero-sum competition, then two strong, conflicting motives

would be manifested as behavior toward the extreme of the behavioral set consistent with the motive that was relatively stronger at that moment. Such extreme behavior, however, could also result from a unidirectional, strong motive.

Consider the following example: Romeo is interested in Juliet, but attempting to initiate a relationship with her carries risks—most obviously, the possibility of rejection. One day, Romeo goes to the library to study. When he arrives, he finds Juliet studying alone at a large table. Romeo's options (i.e., the available behavioral set) include (a) sitting at the same table, but at a comfortable distance from Juliet (the moderate, normative behavior); (b) sitting directly across from Juliet (the extremely affiliative behavior); or (c) leaving and finding somewhere else to study (the extremely self-protective behavior). Romeo might pursue the moderate option (option a) either because of unidirectional motives—he is only weakly interested in affiliating with Juliet or only weakly attending to the threat to the self—or because he is compromising between his desires to affiliate with her but protect himself. Alternatively, Romeo might sit immediately across from her (option b) either because he is strongly motivated to affiliate with her and his self-protection motive is only weakly active or because he is relatively more strongly motivated to affiliate with her in that moment in spite of his highly activated self-protection motive. By the same reasoning, Romeo might leave the library (option c) either because he is strongly motivated to protect himself or because his self-protection motive is relatively stronger than his affiliation motive.

To observe the behavioral consequences of motivational ambivalence in a way that differentiates it from other underlying motivational patterns, it is necessary to create a set of circumstances in which (a) the behavioral set is a forced choice between dichotomous behaviors without a medial option and (b) there are repeated opportunities to engage in this behavioral set. Under these circumstances, ambivalence would lead to inconsistency between the two options over time, whereas unidirectional motives would lead more consistently to one or the other option regardless of motive strength. Returning to the example above, these conditions could be satisfied by (a) seating Juliet at a smaller table, with only one other seat; and (b) observing Romeo navigating this same decision repeatedly. In such a series of forced-choice situations, unidirectional motives would lead Romeo to consistently stay and sit close to Juliet or to consistently leave, whereas ambivalence would lead Romeo to inconsistent behavior: sometimes staying and sometimes leaving.

A main objective of the present research was to create an experimental context in which we could distinguish between ambivalence and other motivational patterns. To this end, as detailed below, we used a social dilemma game paradigm in which participants were required to make a series of choices between the same two dichotomous behavioral options—cooperation (the affiliative behavior) or defection (the self-protective behavior). We were then able to examine whether participants' strategic choices were consistent (i.e., they chose

cooperation or defection consistently) or not (i.e., sometimes cooperating, sometimes defecting).

In addition to inconsistency, another observable characteristic of behavior that can shed light on underlying motives is the time it takes participants to select a behavior from the available set. Whereas unidirectional motives can be pursued without much deliberation, conflicting motives must be reconciled before behavior can be pursued. (Note: This motive reconciliation need not be conscious—reaction time is the standard dependent measure in many social cognition paradigms examining the reconciliation of two conflicting impulses at an implicit level; e.g., Stroop, 1935.) We would expect, therefore, that ambivalence would be associated with longer decision latencies in behavioral selection. Returning to our example, a relationally ambivalent Romeo would hesitate in the doorway long after a unidirectionally motivated Romeo would have either sat down with Juliet or left.

In sum, studying how relational ambivalence is manifested in behavior necessitates differentiating between underlying conflicting versus unidirectional motives. In this research, we therefore examine not only the behavior chosen, but also two additional aspects of that choice: (a) the consistency in the pattern of choices between two dichotomous behavioral options, and (b) the time it takes participants to select between those behaviors in each instance. We hypothesize that the chronic relational ambivalence of the anxiously attached will be manifested as inconsistency and longer decision latencies.

A second challenge in studying the behavioral effects of anxious ambivalence is that both intrapersonal and situational factors can produce motive conflicts. On the one hand, dispositions or prior experiences can lead to chronic activation of conflicting motives or to a habitual favoring of one motive over the other; an example of this would be the chronic relational ambivalence of the anxiously attached as compared to the chronic relational optimism of the securely attached or the chronic relational pessimism of the avoidantly attached. On the other hand, features of the situation can exacerbate or alleviate motive conflicts. For example, complex social opportunities—such as the opportunity for relationship initiation illustrated in our Romeo and Juliet scenario—could contextually activate both the motive to affiliate and the motive to protect the self; indeed, certain situational factors might engender relational ambivalence in anyone (Lydon, Jamieson, & Holmes, 1997). That said, other features of the situation could favor one motive over the other. In our scenario, Romeo may be especially mistrustful of Juliet's regard because of a family feud (favoring the self-protection motive), or he may receive some indication that Juliet returns his regard (favoring the affiliation motive). Isolating the effects of ambivalence due to attachment anxiety on behavior thus requires managing the situational factors that might also fuel ambivalence—that is, controlling the structure of the situation. To this end, we used two social dilemma games, the Prisoner's Dilemma (PD) and the Assurance Game (AG), to disentangle situational from intrapersonal influences on ambivalence.

Using Social Dilemmas to Study Relational Ambivalence

Social dilemma games have a long history in psychology and related fields as a tool for investigating motive conflicts (Camerer & Fehr, 2004; Kelley et al., 2003; Kollock, 1998; Skyrms, 2001; Weber, Kopelman, & Messick, 2004) and so are well suited to studying ambivalence. The PD and AG are both two-player social dilemma games in which each player selects between two behavioral options (i.e., cooperate or defect); players' outcomes are determined by the intersection of their behavior in a payoff matrix (see Figure 1). By varying the payoffs for cooperation and defection, the payoff matrices structure the situation presented to participants.

PD payoffs are structured such that the highest payoff for the individual involves defecting when one's partner cooperates (DC); the next highest results from mutual cooperation (CC), which is followed by mutual defection (DD); finally, cooperating when the other defects (CD) yields the lowest payoff for the individual. Therefore, players must resolve two issues when selecting a strategy in the PD: trust ("Is my partner likely to exploit me? Should I defect in defense?") and greed ("Should I exploit my partner, or should I be satisfied with mutual cooperation?"). Because DC is better for the individual than CC, there is a temptation to exploit the other player; players are therefore likely to distrust each other and to mutually defect because the lesser payoff for DD is better than the zero payoff for CD (DD is accordingly the Nash equilibrium for the PD). Nonetheless, researchers have found higher than expected rates of cooperation in the PD, possibly due to an evolved heuristic favoring pro-social reciprocity (Kiyonari, Tanida, & Yamagishi, 2000; Simpson, 2004). With respect to our discussion about conflicting motives, ambivalence and hesitance in the PD (i.e., departures from a wholly cooperative or wholly defecting strategy) may accordingly be attributable to the conflict between either (a) greed versus pro-sociality or (b) self-protection versus affiliation. Both of these conflicts are inherent in the structure of the PD payoffs and could be exacerbated or attenuated by such intrapersonal factors as attachment anxiety.

By contrast, AG payoffs are structured such that mutual cooperation (CC) yields the highest payoff for the individual, thus eliminating the motive to be greedy and exploitative and incentivizing cooperation (for further discussion, see Boone, Declerck, & Kiyonari, 2010; Declerck, Boone, & Kiyonari, 2010). Similar to the PD, however, a self-protection motive could still pull for defection in the AG: If players suspect their partner will defect, players should themselves defect self-protectively because DD yields higher payoffs than CD. Given that the AG incentivizes cooperation and eliminates the temptation to exploit, only those who are chronically unsure whether others can be trusted should defect in the AG, and everyone else should cooperate (the AG's two Nash equilibria: DD and CC). Indeed, research shows that most participants cooperate in the AG, and much higher rates of cooperation are observed

Prisoner's Dilemma

	Your Partner chooses Cooperation/ Strategy A:	Your Partner chooses Defection/ Strategy B:
You choose Cooperation/ Strategy A:	You get \$4 Your partner gets \$4	You get \$0 Your partner gets \$6
You choose Defection/ Strategy B:	You get \$6 Your partner gets \$0	You get \$2 Your partner gets \$2

Assurance Game

	Your Partner chooses Cooperation/ Strategy A:	Your Partner chooses Defection/ Strategy B:
You choose Cooperation/ Strategy A:	You get \$6 Your partner gets \$6	You get \$0 Your partner gets \$4
You choose Defection/ Strategy B:	You get \$4 Your partner gets \$0	You get \$2 Your partner gets \$2

Figure 1 Payoff matrices for the Prisoner's Dilemma and the Assurance Game.

for the AG than the PD (e.g., Boone et al., 2010; Declerck et al., 2010; Simpson, 2004). Because the structure of the AG incentivizes cooperation and removes the motive for exploitation, ambivalent behavior in the AG—inconsistency between cooperation and defection, and hesitation to cooperate—is much more likely to be due to intrapersonal factors. By comparing behavior in the PD and the AG, we can thus differentiate between ambivalence that is relatively more justified by the structure of the situation (PD) versus ambivalence that is less justified by the situation (AG) and so more likely to be due to intrapersonal factors like chronic anxious mistrust and ambivalence.

The Present Investigation

In the following two studies, we used the PD and the AG to investigate the effects of the anxiously attached's chronic relational ambivalence on cooperative behavior. Because we were interested in the effects of attachment anxiety on ambivalence (and not in how attachment anxiety might interact with

partner behavior), participants played “one-shot” games with different partners and feedback about the partner's behavior was withheld (cf. Vicary & Fraley, 2007). Even though participants interact with strangers in these social dilemma games, we expected that attachment would nonetheless influence strategic behavior because attachment style effects have been demonstrated in a variety of paradigms involving a stranger in the laboratory (e.g., Bartz & Lydon, 2006; Mikulincer, 1997; Mikulincer & Nachshon, 1991; Roisman, 2006). Moreover, because of chronic hyperactivation, anxious individuals' attachment systems should be more readily called upon to guide behavior, especially in ambiguous, minimally defined social situations such as these social dilemma games (Collins & Read, 1994; Pietromonaco & Feldman Barrett, 2000).

In Study 1, we investigated the effects of chronic attachment—and especially attachment anxiety—on cooperation in the social dilemma games. We presented participants with two possible strategies and recorded their choices. Although we evaluated whether participants chose to cooperate or defect on a given round, we were primarily interested in participants'

ambivalence, which we measured in two ways: First, we examined the consistency of participants' strategic choices within each game as a dichotomous variable: (a) consistency versus (b) inconsistency. We also examined the consistency of participants' strategic choices *across* games as a trichotomous variable—specifically, (a) consistency versus (b) inconsistency without AG defection (ambiguous inconsistency) versus (c) inconsistency with AG defection (mistrustful inconsistency). Our thinking with respect to this trichotomous inconsistency variable was to differentiate between situational factors that might increase defection (i.e., the greed and self-protection motives in the PD payoffs) and more dispositional sources of mistrust. As argued above, hesitance and ambivalence in the AG should be indicative of increased mistrust due to intrapersonal factors, whereas ambivalence in the PD might result from either motive conflict (i.e., trust vs. self-protection or greed vs. pro-sociality) because the payoffs incentivize greed and make mistrust more normative. Having the dichotomous and trichotomous outcomes allowed us to both perform finer-grained analyses on consistency within each game (with the dichotomous outcome) and examine participants' overall pattern of behavior for consistency versus the two types of inconsistency (the trichotomous measure). Importantly, although mistrustful inconsistency should decrease cooperation, it should not maximize defection outright. For this reason, we did not have a strong hypothesis about the effect of anxiety on strategy selection itself (but to the extent that mistrustful inconsistency decreases cooperation beyond the norm, we expected the anxious to be less cooperative).

Secondly, we examined the time it took participants to select their strategy (theorizing that conflicting motives would increase deliberation over strategy selection). We expected that the anxious persons' chronic relational ambivalence would increase deliberation and decisional effort (operationalized as the reaction times associated with strategy selection). We again expected the AG to be especially diagnostic, as ambivalence and mistrust in the AG should be minimized by the incentivizing of cooperation over exploitation. Given the novelty of research on the behavioral consequences of anxious ambivalence, our hypotheses are speculative, though well grounded in attachment theory.

Although our primary interest in this research was to document the effects of attachment anxiety on ambivalence, we also examined attachment avoidance. Here we had two competing hypotheses. The laboratory situation may not be threatening enough to trigger avoidant persons' chronically deactivated attachment system, in which case their behavior would conform to rational game norms. Alternatively, if the situation did overcome deactivation, avoidant distrust would lead to less cooperative behavior, but not to the inconsistency or hesitation characteristic of anxiety.

In Study 2, we investigated whether contextually activating attachment security would override the effects of chronic relational ambivalence for the anxiously attached. Most people—even the chronically anxious—have had some

positive relational experiences, and so they have secure schemas available (Baldwin, Keelan, Fehr, Enns, & Koh-Rangarajoo, 1996) even if they are not ordinarily activated. It is therefore possible to temporarily increase the experience of felt security, thereby ameliorating the effects of insecure attachment; security priming has even been shown to increase pro-social behavior more generally (Mikulincer & Shaver, 2007b). We hypothesized that priming security in the chronically anxious would minimize ambivalence, resolving the motivational conflict in favor of affiliation over self-protection, and thereby leading the anxious to more consistently and fluently choose the pro-social, cooperative strategy.

STUDY 1

Method

Participants

Participants were 99 single undergraduates (25 males, mean age=20.8) recruited from online classifieds to participate in a study on personality and social decisions. Experimental sessions were conducted in groups of five to ten participants. Compensation was \$12, although participants were initially led to believe compensation was tied to game outcomes (see below). Five participants expressed suspicions during debriefing and were excluded.

Procedure

Participants were first seated together around a table for 5 minutes. After this “get acquainted” period, participants were told they would complete some questionnaires and play some interactive computer games. After obtaining informed consent, the experimenter distributed questionnaires, including the Experiences in Close Relationships scale (ECR; Brennan, Clark, & Shaver, 1998), a self-report measure of attachment anxiety and avoidance. To reduce participant burden, we used a 29-item version, which was modified by N. L. Collins (personal communication, April 21, 2005) to reduce item redundancy. Participants rated each item from 1 (*disagree strongly*) to 7 (*agree strongly*). Alphas for the 14 anxiety and 15 avoidance items were .90 and .89, respectively.

After the questionnaires, the experimenter explained the computer games in detail. Participants were told they would play four rounds of the “Numbers Game,” each with a different randomly selected partner. In fact, the games did not involve a partner. Participants received no feedback between rounds; ostensibly, the results were being held until the end of the study. By starting each round with a new partner and withholding feedback, we sought to have participants approach each round afresh. Using a large illustration (similar to Figure 1, but without the “Cooperation” or “Defection” labels), participants were told that for each round, they and their partner would independently select either “Strategy A” (cooperation) or “Strategy B” (defection). Referencing the

illustrated AG and PD payoff matrices, the experimenter explained that there were two versions of the game, each with a different matrix of outcomes. To augment the importance of their strategic choices, participants were told compensation for the study depended on the game outcomes; ostensibly, they would receive a \$6 base, to which the amount from a randomly selected round of the game would be added. All participants actually received \$12 at the end of the study.

After ensuring that participants understood the games and payoffs, the experimenter escorted them to individual cubicles around the perimeter of the room and started the games, programmed in E-Prime 1.1 (2003) and presented on desktop PCs. The program started with an instruction screen; the time it took participants to read and click through this screen was recorded as their baseline reading and response time. To increase the realism of the games, participants were then given the opportunity to enter an alias and brief message that would ostensibly be shown to their partner at each round of the game. They were told that they should not put anything that could be used to immediately identify them or anything about what their strategy would be; the experimenter reviewed everyone's aliases and messages. When everyone was ready, the experimenter instructed participants to proceed with the games.

Participants played two consecutive rounds of each game, presented in randomized blocks, for four rounds in total, each with a different ostensible partner. To augment the perception that they were playing with a real person, participants were presented with an alias and message from the partner with whom they were ostensibly playing that round of the game. The alias and message were randomly selected without replacement from four possible experimenter-generated aliases (FunnyHaHa, snoopy, GeographyRoCKs, and redbull69) and messages ("soo, how's it going"; "Hey! Good luck!"; "i like banana splits. yellow is my favourite colour"; and "what's up?"). Participants were then presented with the payoff matrix for that round. On the following screen, which continued to display the matrix for that round as a reminder, they were prompted, "Please select your strategy for this round by typing either 1 or 2" (1="Strategy A"/*cooperation*, 2="Strategy B"/*defection*). The strategy they selected and the time it took them to select the strategy were recorded. As mentioned above, participants received no feedback about their ostensible partner's behavior, as all of the results were supposedly being held until the end of the session. At the end of the round, the computer displayed an interim screen, indicating that it was connecting the participant to his or her new partner for the next round. After all four game rounds, participants completed a funneled probe for suspicion and then were debriefed and compensated.

Analysis Overview

For each participant, we have both the selected strategy (cooperate or defect) and the time it took him or her to select a

strategy, recorded over the two rounds of the AG and two rounds of the PD. Our four outcomes of interest were as follows:

1. Strategy selection for each round, which was recoded as 0 (defection) and 1 (cooperation).
2. Dichotomous strategy consistency; this was coded for each game so that participants received two scores, one for the AG and one for the PD. We assigned a code of 1 for consistent behavior in both rounds of a given game and a code of 0 for inconsistent behavior in both rounds of a game.
3. Trichotomous strategy consistency; this was coded across the PD and the AG (using all four rounds). We assigned a code of 0 for "consistent" (100% cooperation or 100% defection across games), 1 for "ambiguous inconsistency" (inconsistency that did not include AG defection), or -1 for "mistrustful inconsistency" (inconsistency that included AG defection). With these codes, we could compare both kinds of inconsistency to a benchmark of consistency.
4. Strategy selection time, i.e., the reaction time (RT) associated with strategy selection in each round (RTs were positively skewed, so we applied the square root transformation).

Note that outcomes 2–4 (above) are our indicators of ambivalence. The distribution of participants among the categorical outcomes 1–3 is presented at the top of Table 1.

We conducted regression analyses appropriate to the given dependent variable as detailed below. For the strategy selection, dichotomous strategy consistency, and selection time outcomes, the predictors were game (coded as $-0.5=AG$ and $0.5=PD$), attachment anxiety and avoidance (both mean centered), and all two- and three-way interactions. For the selection time outcome, we also covaried for baseline reading speed and for strategy selection (i.e., to cooperate or to defect) to ensure that the RT effects were not due to a more cooperative strategy simply yielding faster RTs. For the trichotomous strategy consistency outcome, which is operationalized across games, the predictors were anxiety, avoidance, and the two-way interaction. Significant interactions were decomposed following the procedures outlined by Aiken and West (1991).

Results and Discussion

Strategy Selection

To examine strategy selection, which was measured within participant, we conducted a multilevel logistic regression, the results of which are described in the top half of Table 2. The main effect of game indicates that, as is typically found, our participants were less cooperative in the PD than in the AG. Both anxiety and avoidance predicted less cooperative behavior, although these effects did not reach significance ($ps < .10$). None of the interactions were significant.

Table 1 Studies 1–2: Descriptive Frequencies for Strategy Selection, Dichotomous Inconsistency, and Trichotomous Inconsistency

Study, Game, and Condition	Strategy Selection Over Two Rounds			Dichotomous Consistency		Trichotomous Consistency		
	Defected Twice	Cooperated and Defected	Cooperated Twice	Consistent	Inconsistent	Consistent	Ambiguous Inconsistency	Mistrustful Inconsistency
Study 1						43	30	21
Assurance Game	13	18	63	76	18			
Prisoner's Dilemma	34	24	36	70	24			
Study 2								
No prime						2	15	12
Assurance Game	1	11	17	18	11			
Prisoner's Dilemma	15	11	3	10	19			
Prime						11	9	7
Assurance Game	2	7	18	20	7			
Prisoner's Dilemma	4	13	10	19	8			

Table 2 Studies 1–2: Multilevel Regression Predicting Strategy Selection

Predictor	b	SE	df	t	95% Confidence Interval	
					Lower Bound	Upper Bound
Study 1						
Intercept	0.79**	0.21	90	3.83	0.38	1.2
Game	-1.54**	0.27	278	-5.67	-2.08	-1.01
Anxiety	-0.32 [†]	0.18	90	-1.79	-0.68	0.04
Game × Anxiety	0.15	0.23	278	0.64	-0.31	0.61
Avoidance	-0.34 [†]	0.2	90	-1.74	-0.73	0.05
Game × Avoidance	0.14	0.26	278	0.53	-0.37	0.65
Anxiety × Avoidance	0.01	0.14	90	0.09	-0.27	0.29
Game × Anxiety × Avoidance	-0.21	0.19	278	-1.12	-0.58	0.16
Study 2						
Intercept	1.68	1.66	52	1.01	-1.66	5.02
Game	-2.17**	0.43	166	-5.02	-3.03	-1.32
Prime	0.77*	0.37	52	2.09	0.03	1.50
Game × Prime	1.20 [†]	0.63	166	1.91	-0.04	2.44
Premeasured anxiety	-0.08	0.30	52	-0.26	-0.67	0.52
Premeasured avoidance	-0.29	0.18	52	-1.57	-0.65	0.08

Note. The unstandardized *b* is the difference in the log-odds of *y* for a unit difference in *x*. ***p* < .01. **p* < .05. [†]*p* < .10.

Dichotomous Strategy Consistency

We conducted a multilevel logistic regression to examine this dichotomous strategy consistency outcome, which is operationalized as a repeated measure; the results are presented in the top half of Table 3. There was a main effect of anxiety such that more anxious participants were less consistent in their responding. There was also a Game × Anxiety interaction indicating that this effect of anxiety was significant in the AG, *b* = -0.81, 95% CI [-1.39, -0.22], *t*(90) = 2.72, *p* < .01, but not in the PD, *b* = -0.09, 95% CI [-0.51, 0.34], *t*(90) = -0.41, *p* = .68.

Trichotomous Strategy Consistency

To examine the trichotomized consistency of participants' strategy selection, we conducted a multinomial logistic regression, with the reference category set to 0 (consistent). The results are presented in Table 4. As predicted, anxiety was

associated with mistrustful inconsistency but not ambiguous inconsistency. Neither avoidance nor the Anxiety × Avoidance interaction were significant predictors in the model.

Strategy Selection Time

To examine the transformed RTs, measured within participant, we conducted a multilevel regression analysis, the results of which are presented in the top half of Table 5. We found a main effect of anxiety such that more anxious participants were slower in their strategy selection across games. The main effect of game was not significant. However, as predicted, the main effect of anxiety was moderated by a significant Anxiety × Game interaction. As illustrated in Figure 2, all participants, regardless of anxiety, were relatively slow in the PD. However, low anxious participants' decision latencies sped up from the PD to the AG, *b* = -13.82, CI [-25.83, -1.81], *t*(277) = 2.27, *p* = .02,

Table 3 Studies 1–2: Multilevel Regression Predicting Dichotomous Consistency

Predictor	<i>b</i>	SE	<i>df</i>	<i>t</i>	95% Confidence Interval	
					Lower Bound	Upper Bound
Study 1						
Intercept	1.42**	0.21	90	6.70	1.00	1.84
Game	−0.69†	0.41	90	−1.67	−1.51	0.13
Anxiety	−0.45*	0.19	90	−2.41	−0.82	−0.08
Game × Anxiety	0.72*	0.36	90	1.99	0.00	1.43
Avoidance	0.13	0.21	90	0.62	−0.28	0.54
Game × Avoidance	−0.34	0.40	90	−0.85	−1.14	0.46
Anxiety × Avoidance	−0.16	0.16	90	−0.98	−0.47	0.16
Game × Anxiety × Avoidance	0.32	0.31	90	1.03	−0.30	0.94
Study 2						
Intercept	−0.63	2.17	52	−0.29	−4.98	3.72
Prime	1.53	1.31	52	1.17	−1.10	4.17
Game	0.00	0.55	54	0.00	−1.10	1.10
Prime × Game	−0.99	0.80	54	−1.24	−2.61	0.62
Premeasured anxiety	0.19	0.36	52	0.52	−0.54	0.91
Premeasured avoidance	0.07	0.22	52	0.33	−0.37	0.52

Note. The unstandardized *b* is the difference in the log-odds of *y* for a unit difference in *x*.
 ***p* < .01. **p* < .05. †*p* < .10.

Table 4 Study 1: Multinomial Logistic Regression Predicting Trichotomous Strategy Consistency

Predictor	<i>b</i>	SE	Wald (<i>z</i> ²)	<i>df</i>	Exp(<i>b</i>)	95% Confidence Interval	
						Lower Bound	Upper Bound
For mistrustful inconsistency vs. consistency							
Intercept	−0.87**	0.30	8.52	1			
Anxiety	0.65*	0.27	5.90	1	1.92	1.13	3.25
Avoidance	0.09	0.29	0.09	1	1.09	0.62	1.92
Anxiety × Avoidance	0.17	0.24	0.52	1	1.19	0.75	1.88
For ambiguous inconsistency vs. consistency							
Intercept	−0.35	0.24	2.04	1			
Anxiety	0.10	0.22	0.21	1	1.10	0.72	1.68
Avoidance	−0.04	0.24	0.04	1	0.96	0.60	1.52
Anxiety × Avoidance	0.06	0.19	0.10	1	1.06	0.73	1.56

Note. The unstandardized *b* is the difference in the log-odds of *y* for a unit difference in *x*.
 ***p* < .01. **p* < .05. †*p* < .10.

whereas high anxious participants did not change significantly, $b = 3.69$, CI [−8.00, 15.38], $t(277) = -.62$, $p = .54$. In the AG, when cooperation is incentivized and so ambivalence is mistrustful, higher anxiety was associated with increased deliberation, $b = 10.47$, CI [4.01, 16.94], $t(277) = 3.19$, $p < .01$.

Summary for Attachment Anxiety

As predicted, attachment anxiety was associated with less consistent strategy selection, specifically in the AG. More anxious participants' inconsistency included AG defection—mistrustfully selecting away from optimal payoffs in favor of self-protection. Compared to inconsistent responding in the PD, wherein the structure of the payoff matrix justifies

concerns about the possibility of exploitation, inconsistency in the AG is more clearly attributable to intrapersonal factors such as the anxious participants' chronic relational ambivalence. With respect to the choice between cooperation and defection, anxiety was only marginally associated with decreased cooperation; thus, it appears that mistrustful inconsistency did not reliably decrease cooperation below normative levels.

Finally, anxiety was also associated with longer strategy selection RTs—our operationalization of the added decisional effort necessitated by ambivalence. The effect of anxiety was specific to the AG (all participants were slower in the PD) and is thus convergent with the both the dichotomous and trichotomous inconsistency findings (which were also specific

Table 5 Studies 1–2: Multilevel Regression Predicting Strategy Selection Time

Predictor	<i>b</i>	SE	<i>df</i>	<i>t</i>	95% Confidence Interval	
					Lower Bound	Upper Bound
Study 1						
Intercept	65.00**	12.66	89	5.13	39.84	90.17
Baseline reading speed	0.39**	0.12	277	3.19	0.15	0.63
Strategy selection	-10.07 [†]	5.32	277	-1.89	-20.55	0.40
Game	4.71	4.23	277	1.11	-3.62	13.03
Anxiety	6.88*	2.78	277	2.48	1.42	12.35
Game × Anxiety	-7.18*	3.51	277	-2.04	-14.08	-0.27
Avoidance	-3.64	3.01	277	-1.21	-9.57	2.28
Game × Avoidance	-4.46	3.76	277	-1.18	-11.87	2.96
Anxiety × Avoidance	-0.87	2.12	277	-0.41	-5.05	3.31
Game × Anxiety × Avoidance	2.07	2.70	277	0.77	-3.24	7.38
Study 2						
Intercept	72.47	47.56	51	1.52	-23.01	167.95
Baseline reading speed	-0.05	0.17	165	-0.27	-0.38	0.29
Strategy selection	-5.58	5.94	165	-0.94	-17.30	6.15
Game	-7.53	6.94	165	-1.09	-21.24	6.17
Prime	-2.04	9.42	165	-0.22	-20.65	16.57
Game × Prime	23.84*	9.28	165	2.57	5.52	42.15
Premeasured anxiety	10.64	7.31	165	1.46	-3.79	25.07
Premeasured avoidance	-4.80	4.52	165	-1.06	-13.72	4.12

Note. The unstandardized *b* is the difference in the square root of *y* for a unit difference in *x*.
 ***p* < .01. **p* < .05. [†]*p* < .10.

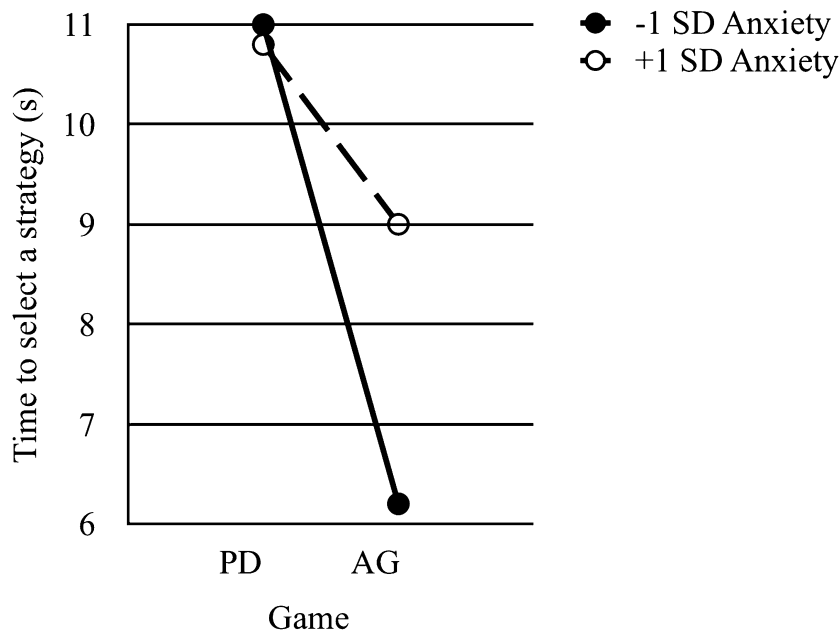


Figure 2 Study 1: Game × Attachment Anxiety interaction predicting time to select a strategy.

to the AG). We believe the structure of the PD payoffs induces sufficient ambivalence in all participants—with the two conflicts of greed versus pro-sociality and trust versus self-protection—to obscure the effects of the chronic relational ambivalence associated with attachment anxiety on decisional effort in this game. By contrast, the AG presents a simpler decision than the PD: Only the motive conflict between

trust and self-protection is present. This is consistent with low anxious participants’ faster decisions in the AG as compared to the PD. For participants high in anxiety, decision latencies remained slow in the AG, consistent with the additional deliberation necessary to struggle with their mistrust. Importantly, this hesitation is independent of the behavior that was eventually chosen: Anxious participants were slower

regardless of whether their eventual choice was cooperation or defection.

Summary for Attachment Avoidance

In contrast to anxiety, avoidance was not associated with inconsistent or hesitant behavior. Attachment avoidance was only marginally predictive of less cooperation. These findings neither confirm nor disconfirm either of our competing avoidance hypotheses: It appears that the social dilemma context was not sufficient to overcome chronic deactivation, but the marginal decrease in cooperation and lack of evident ambivalence are consistent with unidirectional avoidant distrust.

Transition From Study 1 to Study 2

The results of Study 1 indicate that the chronic relational ambivalence associated with attachment anxiety leads to more inconsistent, deliberative responding. However, even the chronically anxious have some experiences of felt security, so it may be possible to activate these experiences to increase pro-social responding (Baldwin et al., 1996; Mikulincer & Shaver, 2007b). In Study 2, we investigated whether priming security in the chronically anxious would help them overcome their relational ambivalence, reconciling the motive conflict in favor of trust and affiliation over self-protection, and promoting more consistently cooperative and fluent responding.

STUDY 2

Method

Participants

We recruited 61 undergraduates (18 males, mean age=20.2) to participate in a study on memory and social decisions. Participants had previously completed a mass recruitment Web survey and were preselected to be above the median in attachment anxiety as measured by the 29-item ECR, based on that sample ($N=1,005$; anxiety >3.60). As in Study 1, experimental sessions were conducted in groups of five to ten participants; compensation was \$12. Five participants expressed suspicion during debriefing and were excluded.

Procedure

We used the same procedure as in Study 1, with four modifications. First, prior to the social dilemma games, we added an attachment priming procedure (from Mikulincer, Shaver, Gillath, & Nitzberg, 2005), presented as a memory task. Briefly, before beginning the computer tasks, participants were randomly assigned to recall either a close, supportive other (security prime) or a school acquaintance (control) and were asked in a paper-and-pencil questionnaire to indicate this person's first name, list several of his or her traits, and briefly

(up to three-quarters of a page) describe a time when this person was a source of support (security prime) or a time when they were in class together (control). Participants were told that they would be asked to recall this information periodically during the study. Second, the questionnaire portion was moved to the end of the study so that the priming task was immediately followed by the social dilemma games. Third, between the two blocks of the social dilemma games, participants were asked to recall the name and traits they had indicated, as a booster of the priming manipulation. Fourth, after an additional booster (recalling the supportive situation in the security prime condition, or the academic situation in the control condition), participants concluded the session with questionnaires, including the 29-item ECR as a manipulation check.

Analysis Overview

Participant strategy selection and consistency were coded as in Study 1. The distribution of participants among the categorical outcomes is presented in the bottom of Table 1. RTs were again positively skewed and so were transformed using the square root; analysis of this outcome again covaries for baseline reading speed and for strategy selection. For this study, the predictors for the strategy selection, dichotomous consistency, and selection time outcomes were game (coded as in Study 1), prime (coded as 0 for the control condition and 1 for the prime condition), and the two-way interaction; for trichotomous strategy consistency, operationalized across games, prime was the only predictor. We include premeasured attachment anxiety and avoidance in all of the analyses. Significant interactions were again decomposed using the procedures described by Aiken and West (1991).

Results and Discussion

Manipulation Check

To examine the effect of the security prime on attachment anxiety, we conducted a 2×2 (Time \times Prime) mixed between-within ANOVA to look at change in attachment anxiety from the premeasure to the experimental session measure. There was a significant effect of time, $F(1, 54)=4.68, p=.04$, modified by a marginal Prime \times Time interaction, $F(1, 54)=3.95, p=.05$. Planned comparisons showed that anxiety decreased from the pre- to the in-session measure for security-primed anxious participants ($M=4.65$ to $M=4.36, t(26)=4.09, p<.01$), but not for the chronically anxious controls ($M=4.48$ to $M=4.46$), but at neither time did the security-primed anxious significantly differ from the chronically anxious.

Strategy Selection

We examined strategy selection, measured within participant, using a multilevel logistic regression; the results are presented in the bottom half of Table 2. As in Study 1, there was less

cooperation in the PD than the AG. There was also a main effect of prime, with security-primed anxious participants showing more cooperative behavior than the control anxious participants. These effects were moderated by a Game × Prime interaction. As illustrated in Figure 3, security priming increased the likelihood that chronically anxious participants would cooperate in the PD, $b = 1.36$, $CI [.47, 2.26]$, $t(54) = 3.04$, $p < .01$, but this effect appears to have been constrained by a ceiling effect in the AG.

Dichotomous Strategy Consistency

We conducted a multilevel logistic regression to examine the consistency of participants' selected strategy, with the reference category set to 0 (consistent); the results are presented in the bottom half of Table 3. There were no significant effects. However, when we examined dichotomous

consistency across games (i.e., a 100% cooperation or defection strategy over all four rounds vs. inconsistency), we found a significant effect of the prime such that primed participants were more consistent in their behavior than no prime anxious participants, $\chi^2(1) = 8.42$, $p < .01$.

Trichotomous Strategy Consistency

We conducted a multinomial logistic regression to examine the consistency of participants' selected strategy, with the reference category set to 0 (consistent); the results are presented in Table 6. Priming security decreased mistrustful inconsistency (in the direction of consistent cooperation) in the chronically anxious, reminiscent of the low anxious participants in Study 1. Moreover, priming security also decreased ambiguous inconsistency. Although we neither observed nor predicted an

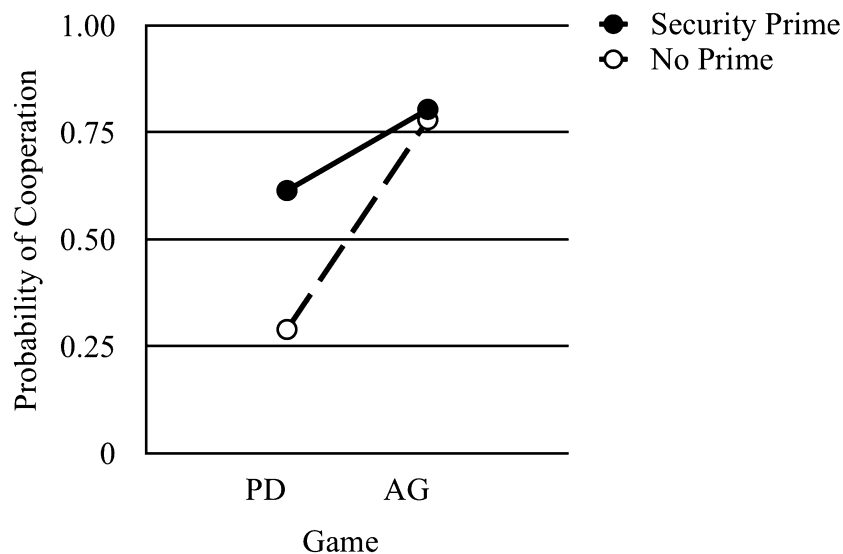


Figure 3 Study 2: Game × Prime interaction predicting strategy selection.

Table 6 Study 2: Multinomial Logistic Regression Predicting Trichotomous Strategy Consistency

Predictor	b	SE	Wald (z ²)	df	Exp(b)	95% Confidence Interval	
						Lower Bound	Upper Bound
For mistrustful inconsistency vs. consistency							
Intercept	-0.69	3.68	0.04	1			
Premeasured anxiety	0.16	0.64	0.06	1	1.17	0.33	4.15
Premeasured avoidance	-0.13	0.38	0.12	1	0.88	0.42	1.83
Prime	2.29*	0.92	6.26	1	9.87	1.64	59.27
For ambiguous inconsistency vs. consistency							
Intercept	-0.23	3.54	0.00	1			
Premeasured anxiety	0.10	0.62	0.03	1	1.10	0.33	3.74
Premeasured avoidance	-0.11	0.36	0.09	1	0.90	0.45	1.80
Prime	2.25*	0.89	6.42	1	9.44	1.66	53.60

Note. The unstandardized b is the difference in the log-odds of y for a unit difference in x.

**p < .01. *p < .05. †p < .10.

association between chronic low anxiety and decreased self-interested inconsistency in Study 1, this finding is consistent with the prime's overall pro-social effect. Increasing felt security resolved both motive conflicts in favor of pro-social responding: dyadic interest over self-interest and affiliation over self-protection.

Strategy Selection Time

The transformed RTs were examined nested within participant using a multilevel regression; the results are presented in the bottom half of Table 5. There were no significant main effects. Consistent with Study 1, we found a Game \times Prime interaction, which is illustrated in Figure 4. Upon decomposing this interaction, we found that security-primed anxious participants sped up their strategy selection in the AG compared to the PD, $b=-16.41$, CI [-29.53, 3.29], $t(164)=2.47$, $p=.01$, whereas anxious controls did not, $b=7.25$, CI [-9.20, 20.67], $t(164)=1.05$, $p=.30$. Although this pattern of results is consistent with Study 1, the distribution of the RTs has changed—decision latencies were longer in Study 2 than Study 1. This is likely attributable to the additional cognitive load due to the ostensible memory task.

Summary

Security priming helped the chronically anxious overcome their ambivalence, decreasing mistrustful inconsistency; moreover, it decreased self-interested inconsistency and increased cooperation in the PD. For time to select a strategy, the security-primed anxious participants, like their chronically low anxious counterparts in Study 1, were faster in the AG

than in the PD, which suggests that priming security enabled them to cooperate without much deliberation over trust once concerns about exploitation were eliminated. These data suggest that by contextually activating felt security, it is possible to attenuate anxious individuals' chronic relational ambivalence, resolving the motive conflict in favor of affiliation over self-protection.

GENERAL DISCUSSION

Our interpersonal histories, expectancies, and goals should guide our behavior as we navigate the fundamental human conflict between the motive to affiliate and the motive to protect the self. For the anxiously attached, a history of inconsistent experiences in felt security creates a particularly strong conflict between these motives; this chronic relational ambivalence should have behavioral consequences. We examined the effect of anxious individuals' chronic relational ambivalence on pro-social behavior using a social dilemma paradigm. As predicted, chronic attachment anxiety was associated with mistrustfully inconsistent responding, as well as with longer decision latencies. Importantly, this inconsistency and hesitance was specific to the AG—a context in which the structure of the situation (i.e., the payoffs) incentivizes cooperation, minimizing the potential for exploitation by a greedy partner. Thus, ambivalence in the AG should be more indicative of intrapersonal factors such as the chronic mistrust associated with attachment anxiety. By contrast, anxiety did not increase inconsistency in the PD, wherein the payoff structure incentivizes exploitation and so increases mistrust in everyone. Our findings are particularly unique because rather than simply providing another example of anxious individuals' chronic

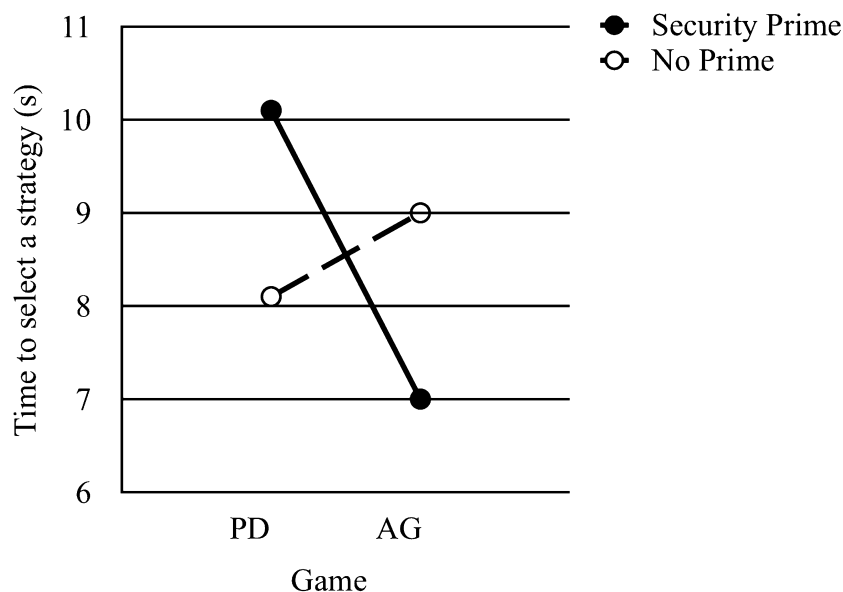


Figure 4 Study 2: Game \times Prime interaction predicting time to select a strategy.

mistrust—which would lead to consistent and fluent self-protective defection—we were able to uncover their chronic relational ambivalence and observe how it influenced their behavior. It is the combination of chronic, self-protective mistrust with hyperactivated affiliation that leads to inconsistency and increased decisional effort.

Encouragingly, we were able to ameliorate the hesitant, mistrustful inconsistency of the chronically anxiously attached by reminding them of a secure relationship. The motive conflict was resolved in favor of affiliative, cooperative behavior, leading to consistent cooperation and more fluent responding. Interestingly, priming felt security decreased not only the mistrustful inconsistency associated with the anxious individuals' relational ambivalence, but also ambiguous inconsistency, suggesting a possible dampening of greed relative to an evolved pro-social heuristic. Consistent with other reports (see Mikulincer & Shaver, 2007b, for a review), priming felt security helped pro-sociality to carry the day. Although the promotion of pro-social responding is generally desirable in communal circumstances, it does carry the risk of exploitation. Future research should investigate not only the pro-social benefits of increasing felt security, but also the potential costs to the self in contexts that are not communal. Indeed, this idea reflects a foundational tenet of attachment theory: Although insecurity is suboptimal, it developed adaptively to manage a suboptimal social environment.

Attachment theory is not the only theoretical perspective that takes into consideration the ways in which interpersonal insecurity affects the reconciliation of affiliation and self-protection motives; indeed, this motive conflict is also fundamental to the risk-regulation perspective (Murray et al., 2006). Insecurity in this perspective (i.e., low self-esteem) has been associated with ambivalence toward relationships and relationship partners (Murray et al., 2008; Murray, Holmes, & Griffin, 2000). However, in the risk-regulation framework, the primary defense for the insecure is to protect the self at the cost of affiliation. By contrast, attachment theory differentiates between two types of insecurity, and although avoidance is associated with deactivation and distancing, anxiety is associated with hyperactivation of proximity seeking along with hypervigilance for threat. Further research into how the anxious manage ambivalence between affiliation and self-protection may help to reconcile these two important theories.

Strengths and Limitations

To our knowledge, these are among the first studies to evaluate the relational ambivalence associated with attachment anxiety as it is manifested in behavior. Although the behavior was artificial and constrained, it had social consequences, ostensibly determining outcomes for the self and the partner. These are also among the first studies to show anxiety influencing behavior during such a minimal interaction as a social dilemma game with a stranger. Moreover, we showed these effects whether we measured stable individual differences in

attachment or contextually activated attachment security to counter anxiety's effects. Selectively recruiting participants high in anxiety for Study 2 made this a particularly rigorous test of the priming manipulation.

This research offers potential solutions to methodological difficulties in measuring the behavioral consequences of ambivalence. We examined the consistency of selections between two dichotomous behaviors over time, while varying and combining relevant motives in such a way as to control structural aspects of the situation so as to hone in on ambivalence due to intrapersonal factors. Although we used social dilemma games, the basic algorithm could be adapted to other paradigms. Furthermore, we used decision latencies as a second indicator of ambivalence. Although slower decisions could result from factors other than the increased decisional effort necessary to reconcile conflicting motives (e.g., need for cognition or fear of invalidity), the fact that our two measures of ambivalence converge helps rule out these alternative explanations (see also Mikulincer et al., 2010, for a slightly different use of reaction times as an index of relational ambivalence and the elimination of several alternative explanations). We think that the use of reaction times as an indicator of ambivalence and moreover the convergence of our multiple indicators of ambivalence are particular strengths of this research.

The present investigation focused on the effects of the chronic relational ambivalence characteristic of attachment anxiety on cooperative behavior. However, other intrapersonal factors are implicated in pro-social processes, in particular the Big Five traits of Extraversion, Agreeableness, and Neuroticism, as well as social value orientations (Van Lange, 1999; Van Lange, Otten, De Bruin, & Joireman, 1997). Extraversion and Agreeableness are more reliably associated with avoidant insecurity than anxious insecurity (Mikulincer & Shaver, 2007a) and would predict consistent cooperation rather than inconsistency between cooperation and defection; likewise, there is no obvious theoretical rationale associating Extraversion or Agreeableness with increased decision latency.

Neuroticism is more consistently linked to attachment anxiety (Mikulincer & Shaver, 2007a), and the relationship between Neuroticism and cooperation in the literature is unclear (Ashton, Paunonen, Helmes, & Jackson, 1998; Hirsh & Peterson, 2009; Kurzban & Houser, 2001; Lu & Argyle, 1991). The emotional instability characteristic of Neuroticism might also increase inconsistent behavior, cycling with emotional highs and lows, but unlike ambivalence, it would not necessitate reconciling a motivational conflict and so would not be associated with increased decision latencies (see also Mikulincer et al., 2010, wherein Neuroticism is excluded as an alternative explanation for the anxious individuals' ambivalent motives and attitudes).

Finally, extensive research has been conducted on how social preferences and social value orientations—e.g., being pro-social, altruistic, competitive, or pro-self—affect behavior in social dilemmas (Camerer & Fehr, 2004; Van Lange, 1999).

We are not aware of any research linking attachment and such preferences; indeed, the point we wish to emphasize is that chronically anxious ambivalent individuals are neither pro-social nor pro-self. Although their hypervigilance should be most attuned to minimizing social risks, it seems plausible that, having adapted to a social environment in which others are inconsistently responsive, they have not formed stable preferences.

CONCLUSION

The idea that the anxiously attached exhibit relational ambivalence is a central tenet of attachment theory (Ainsworth et al., 1978; Bowlby, 1973; Mikulincer & Shaver, 2007a). Although we know a great deal about the individual components of this ambivalence (i.e., the hyperactivated affiliation motive and hypervigilance to rejection), we know much less about the consequences of their simultaneous activation for interpersonal processes. Behavioral inconsistency and hesitance have implications for our social outcomes in real life. A partner might interpret such manifestations of ambivalence as mistrust, disinterest, or calculated self-interest, any of which would be poorly received. We hope the current investigation helps bring this compelling but relatively understudied topic back into the minds of researchers. Successfully navigating our social world means finding the optimal balance between affiliation and self-protection, and ambivalence may cost us opportunities to relate. Attachment provides a theoretical framework to increase our understanding of how we habitually weigh the rewards of affiliation against risks to the self, as well as how we can harness context to better calibrate these decisions.

References

- Ainsworth, M. D., Blehar, M., Waters, E., & Wall, S. (1978). *Patterns of attachment: A psychological study of the strange situation*. Hillsdale, NJ: Erlbaum.
- Ashton, M. C., Paunonen, S. V., Helmes, E., & Jackson, D. N. (1998). Kin altruism, reciprocal altruism, and the Big Five personality factors. *Evolution and Human Behaviour*, *19*, 243–255.
- Baldwin, M. W., Keelan, J. P. R., Fehr, B., Enns, V., & Koh-Rangarajoo, E. (1996). Social-cognitive conceptualization of attachment working models: Availability and accessibility effects. *Journal of Personality and Social Psychology*, *71*, 94–109.
- Bartz, J. A., & Lydon, J. E. (2006). Navigating the interdependence dilemma: Attachment goals and the use of communal norms with potential close others. *Journal of Personality and Social Psychology*, *91*, 77–96.
- Bartz, J. A., & Lydon, J. E. (2008). Relationship-specific attachment, risk regulation, and communal norm adherence in close relationships. *Journal of Experimental Social Psychology*, *44*, 655–663.
- Baumeister, R. F., & Leary, M. R. (1995). The need to belong: Desire for interpersonal attachments as a fundamental human motivation. *Psychological Bulletin*, *117*, 497–529.
- Boone, C., Declerck, C., & Kiyonari, T. (2010). Inducing cooperative behavior among proselves versus prosocials: The moderating role of incentives and trust. *Journal of Conflict Resolution*, *54*, 799–824.
- Bowlby, J. (1973). *Attachment and loss: Separation: Anxiety and anger* (Vol. 2). New York: Basic Books.
- Bowlby, J. (1982). *Attachment and loss: Attachment* (Vol. 1, 2nd ed.). New York: Basic Books. (Original work published 1969)
- Brennan, K. A., Clark, C. L., & Shaver, P. R. (1998). Self-report measurement of adult attachment: An integrative overview. In J. A. Simpson & W. S. Rholes (Eds.), *Attachment theory and close relationships* (pp. 46–76). New York: Guilford Press.
- Camerer, C. F., & Fehr, E. (2004). Measuring social norms and preferences using experimental games: A guide for social scientists. In J. Henrich, R. Boyd, S. Bowles, C. Camerer, E. Fehr, & H. Gintis (Eds.), *Foundations of human sociality: Economic experiments and ethnographic evidence from fifteen small-scale societies* (pp. 55–96). New York: Oxford University Press.
- Collins, N. L., & Read, S. J. (1994). Cognitive representations of attachment: The structure and function of working models. In K. Bartholomew & D. Perlman (Eds.), *Advances in personal relationships: Attachment processes in adulthood* (Vol. 5, pp. 53–90). London: Jessica Kingsley.
- Declerck, C. H., Boone, C., & Kiyonari, T. (2010). Oxytocin and cooperation under conditions of uncertainty: The modulating role of incentives and social information. *Hormones and Behaviour*, *57*, 368–374.
- E-Prime*. (2003). E-Prime (Version 1.1) [Computer software]. Pittsburgh, PA: Psychology Software Tools.
- Hazan, C., & Shaver, P. R. (1987). Romantic love conceptualized as an attachment process. *Journal of Personality and Social Psychology*, *52*, 511–524.
- Hirsh, J. B., & Peterson, J. B. (2009). Extraversion, neuroticism, and the prisoner's dilemma. *Personality and Individual Differences*, *46*, 254–256.
- Kelley, H. H., Holmes, J. G., Kerr, N. L., Reis, H. T., Rusbult, C. E., & Van Lange, P. A. M. (2003). *An atlas of interpersonal situations*. New York: Cambridge University Press.
- Kiyonari, T., Tanida, S., & Yamagishi, T. (2000). Social exchange and reciprocity: Confusion or a heuristic? *Evolution and Human Behavior*, *21*, 411–427.
- Kollock, P. (1998). Social dilemmas: The anatomy of cooperation. *Annual Review of Sociology*, *24*, 183–214
- Kurzban, R., & Houser, D. (2001). Individual differences in cooperation in a circular public goods game. *European Journal of Personality*, *15*, S37–S52.
- Lu, L., & Argyle, M. (1991). Happiness and cooperation. *Personality and Individual Differences*, *12*, 1019–1030.
- Lydon, J. E., Jamieson, D. W., & Holmes, J. G. (1997). The meaning of social interactions in the transition from acquaintanceship to friendship. *Journal of Personality and Social Psychology*, *73*, 536–548.

- Mikulincer, M. (1997). Adult attachment style and information processing: Individual differences in curiosity and cognitive closure. *Journal of Personality and Social Psychology*, *72*, 1217–1230.
- Mikulincer, M., & Nachshon, O. (1991). Attachment styles and patterns of self-disclosure. *Journal of Personality and Social Psychology*, *61*, 321–331.
- Mikulincer, M., & Shaver, P. R. (2003). The attachment behavioural system in adulthood: Activation, psychodynamics, and interpersonal processes. In M. P. Zanna (Ed.), *Advances in experimental social psychology* (Vol. 35, pp. 53–152). San Diego, CA: Academic Press.
- Mikulincer, M., & Shaver, P. R. (2007a). *Attachment in adulthood: Structure, dynamics, and change*. New York: Guilford Press.
- Mikulincer, M., & Shaver, P. R. (2007b). Boosting attachment security to promote mental health, prosocial values, and inter-group tolerance. *Psychological Inquiry*, *18*, 139–156.
- Mikulincer, M., Shaver, P. R., Bar-On, N., & Ein-Dor, T. (2010). The pushes and pulls of close relationships: Attachment insecurities and relational ambivalence. *Journal of Personality and Social Psychology*, *98*, 450–468.
- Mikulincer, M., Shaver, P. R., Gillath, O., & Nitzberg, R. A. (2005). Attachment, caregiving, and altruism: Boosting attachment security increases compassion and helping. *Journal of Personality and Social Psychology*, *89*, 817–839.
- Murray, S. L., Derrick, J. L., Leder, S., & Holmes, J. G. (2008). Balancing connectedness and self-protection goals in close relationships: A levels-of-processing perspective on risk regulation. *Journal of Personality and Social Psychology*, *94*, 429–459.
- Murray, S. L., Holmes, J. G., & Collins, N. L. (2006). Optimizing assurance: The risk regulation system in relationships. *Journal of Personality and Social Psychology*, *132*, 641–666.
- Murray, S. L., Holmes, J. G., & Griffin, D. W. (2000). Self-esteem and the quest for felt security: How perceived regard regulates attachment processes. *Journal of Personality and Social Psychology*, *78*, 478–498.
- Pietromonaco, P. R., & Feldman Barrett, L. (2000). The internal working models concept: What do we really know about the self in relation to others? *Review of General Psychology*, *4*, 155–175.
- Roisman, G. I. (2006). The role of adult attachment security in non-romantic, non-attachment-related first interactions between same-sex strangers. *Attachment & Human Development*, *8*, 341–352.
- Simpson, B. (2004). Social values, subjective transformations, and cooperation in social dilemmas. *Social Psychology Quarterly*, *67*, 385–395.
- Skyrms, B. (2001). The stag hunt. *Proceedings and Addresses of the American Philosophical Association*, *75*, 31–41.
- Stroop, J. R. (1935). Studies of interference in serial verbal reactions. *Journal of Experimental Psychology*, *18*, 643–662.
- Van Lange, P. A. M. (1999). The pursuit of joint outcomes and equality in outcomes: An integrative model of social value orientation. *Journal of Personality and Social Psychology*, *77*, 337–349.
- Van Lange, P. A. M., Otten, W., De Bruin, E. M. N., & Joireman, J. A. (1997). Development of prosocial, individualistic, and competitive orientations: Theory and preliminary evidence. *Journal of Personality and Social Psychology*, *73*, 733–746.
- Vicary, A. M., & Fraley, R. C. (2007). Choose your own adventure: Attachment dynamics in a simulated relationship. *Personality and Social Psychology Bulletin*, *33*, 1279–1291.
- Weber, M. J., Kopelman, S., & Messick, D. M. (2004). A conceptual review of decision making in social dilemmas: Applying a logic of appropriateness. *Personality and Social Psychology Review*, *8*, 281–307.
- West, S. G., & Aiken, L. S. (1991). *Multiple regression: Testing and interpreting interactions*. Newbury Park, CA: Sage.